DEMO-UNIT

The Clever Family

Operation Manual

Contents

Introduction

1 - Safety

Safety requirements

> ⚠ **HAZARD**
>
> **ACCIDENTAL CONTACT WITH LIVE POINTS CAN CAUSE SHOCK, BURNS AND RESULT IN DEATH.**
>
> **Do not try to use the product in any way, before having read this instruction manual**
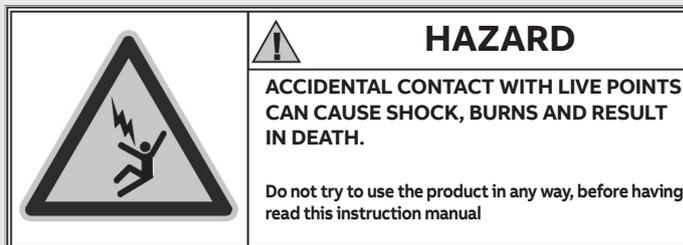
Figure 1

HAZARD! RISK OF ELECTRIC SHOCK! In accordance with the local laws in force, disconnect all electric power supplies when the DEMO-UNIT is being assembled, installed, serviced or decommissioned if persons who are not authorized to work in live installations are present.

WARNING!

- the instructions and descriptions of the procedures given in the following chapters must be read carefully before tests or inspections using the Demo-Unit are performed. ABB declines all liability for damage to persons or property due to incorrect use of the test apparatus and/ or to failure to comply with these instructions.
- the supply voltage of the carrying case must be the same as the supply voltage required to power the accessories and must not exceed 240 Vac.
- always check that the power supply and connection cables to the circuit breaker are intact
- do not open or alter the wiring of the THE CLEVER FAMILY
- do not use the THE CLEVER FAMILY for purposes differing from those described in this instruction manual
- do not disassemble, replace or use the circuit-breakers of the THE CLEVER FAMILY since they are specifically designed for demonstration purposes only
- all information in this document is based on the latest product data available at the time of printing. We reserve the right to make changes to the document at any time and without prior notice. Always check that you have the latest version of the manual by searching for the document online at the ABB website
- contact ABB in case of faulty operation or for any other requirement..

Warnings   **WARNING! READ THE FOLLOWING MANUAL CAREFULLY BEFORE INSTALLING, OPERATING OR REPAIRING THE CIRCUIT BREAKER ON THE CLEVER FAMILY.**

This device must only be used by qualified and expert personnel.

You must assume that the device is not safe to use if:

- the unit shows visible signs of damage
- the unit is not working
- the unit has been damaged during transport.

Overview of the DEMO-UNIT

1 - Product description

THE CLEVER FAMILY

Figure 2

Dimensions: 56 cm x 31 cm x 14 cm

The Clever Family is a Demo-Unit that simulates an operating electrical installation supervised by three ABB low voltage circuit-breakers without the need for the entire, real infrastructure. The live parts and all the mechanical components of a real circuit-breaker are simulated using specifically designed electronic boards.

The purpose of the totem is to demonstrate that all the circuit-breakers in the ABB portfolio are fully compatible with each other. A sample of the Emax 2 family and two samples of the Tmax family are built into the totem to help simulate a structured installation.

The Demo-Unit also supports the entire range of advanced functions provided by smart breakers: cloud communication, logic selectivity, augmented reality.

A carry case is supplied to protect the unit from damage. The totem can be left either inside the carry case be or removed when using the Demo-Unit as the power supply can be accessed from both the front and rear.

2 - Handling and transport

General recommendations

The user must take great care when handling or transporting the unit.

⚠️ **WARNING!**

- make sure that the unit and its components are undamaged before proceeding with any transport or handling operations. Immediately contact the ABB assistance service if damage, missing parts or slight dents are found, or if parts appear to be misshapen.
- The manufacturer declines all liability for damage to persons, animals or property due to use of the unit that fails to comply with the instructions in this manual..

Manual handling

The Demo-Unit in its carry case weighs 16 kg. It can be handled by an operator, in compliance with the applicable local laws governing the maximum weight limit for manual handling and lifting at work.

Proceed as follows when handling the Demo-Unit in the manual mode:

- grasp the Demo-Unit firmly and securely
- take care not to bend your back (see illustration below for the correct posture).
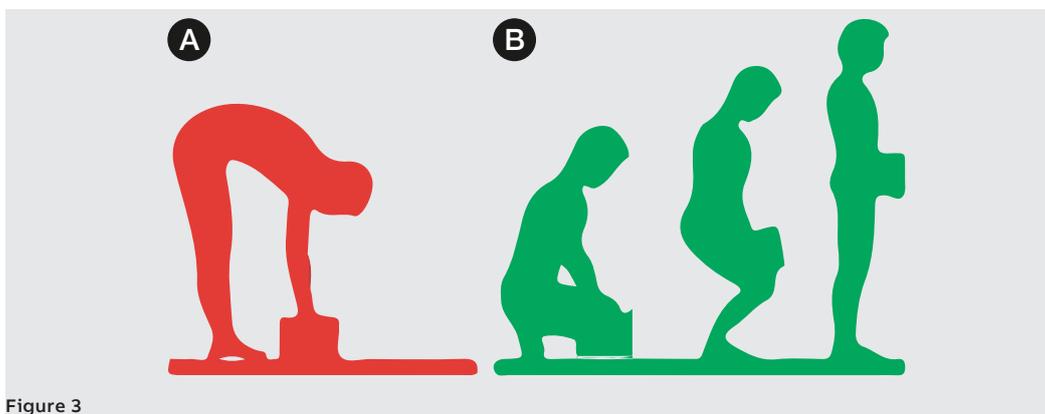
Figure 3

A - wrong posture (red)

B - correct posture (green)

⚠️ **WARNING! The surface over which the apparatus is carried must be smooth and must NEVER slope more than 5°.**

⚠️ **WARNING! The apparatus must be positioned on a horizontal surface.**

3 - Contents

Carry case

Figure 4

Figure 5

Carry case dimensions 65 cm x 42 cm x 22 cm

Devices **Trip Units Emax2 / Tmax XT7 – Ekip Hi-Touch LSIG**

Figure 6

Tmax XT5

Figure 7

Tmax XT2

Figure 8

Ekip Cartridge

Figure 9

Ekip Modules

• Power Supply

The Ekip Supply module energizes all the Ekip trip units and modules installed on the circuit-breaker terminal using different auxiliary currents (both AC and DC).

Figure 10

• Ekip COM Hub

Ekip Com Hub is the new communication module for cloud connection. Using this module, each Tmax XT or Emax 2 circuit-breaker can connect to ABB Ability™ Energy and Asset Manager.

Figure 11

• Ekip Modbus TCP – IEC 61850

In order to communicate, the modules enable SACE Tmax XT and Emax 2 circuit-breakers to be integrated into a company network so as to monitor and communicate with the circuit-breaker itself.

Figure 12

Front Panel

Figure 13

Pos.	Name	Description
A	XT7/Emax2 Slot modules	XT7/Emax2 Trip Unit connection modules
B	Reset button	Key that simulates XT7/Emax2 Ekip Hi-Touch trip reset
C	Open/close button	Open / close to change state of XT7/Emax2
D	Emax2 – Ekip Hi-Touch	Ekip Hi-Touch of the XT7/Emax2
E	XT5 630 – Ekip Hi-Touch	Tmax XT5
F	Current selector	Mechanical selector that indicates the current being simulated
G	XT2 160 – Ekip Hi-Touch	Tmax XT2
H	Ekip Cartridge 4 Slots	Accessory for external modules
I	Ethernet module	Ethernet port for local connections

External connectors

Power supplier

Figure 14

Input: 110-240V ~ 50/60 Hz 0.60A max

Output: 24V 2500mA 60W

Operating temperature: -10°C ~ 55°C

Module Ekip Programming

The Ekip Programming module is used to program the Ekip Trip Units via a PC using Ekip Connect 3 software. Ekip Programming, which is connected to the PC via a USB flash drive, can be useful for downloading/uploading entire sets of parameters for several circuit-breakers, for both their maintenance and first configuration.

Figure 15

4 - Connection diagrams
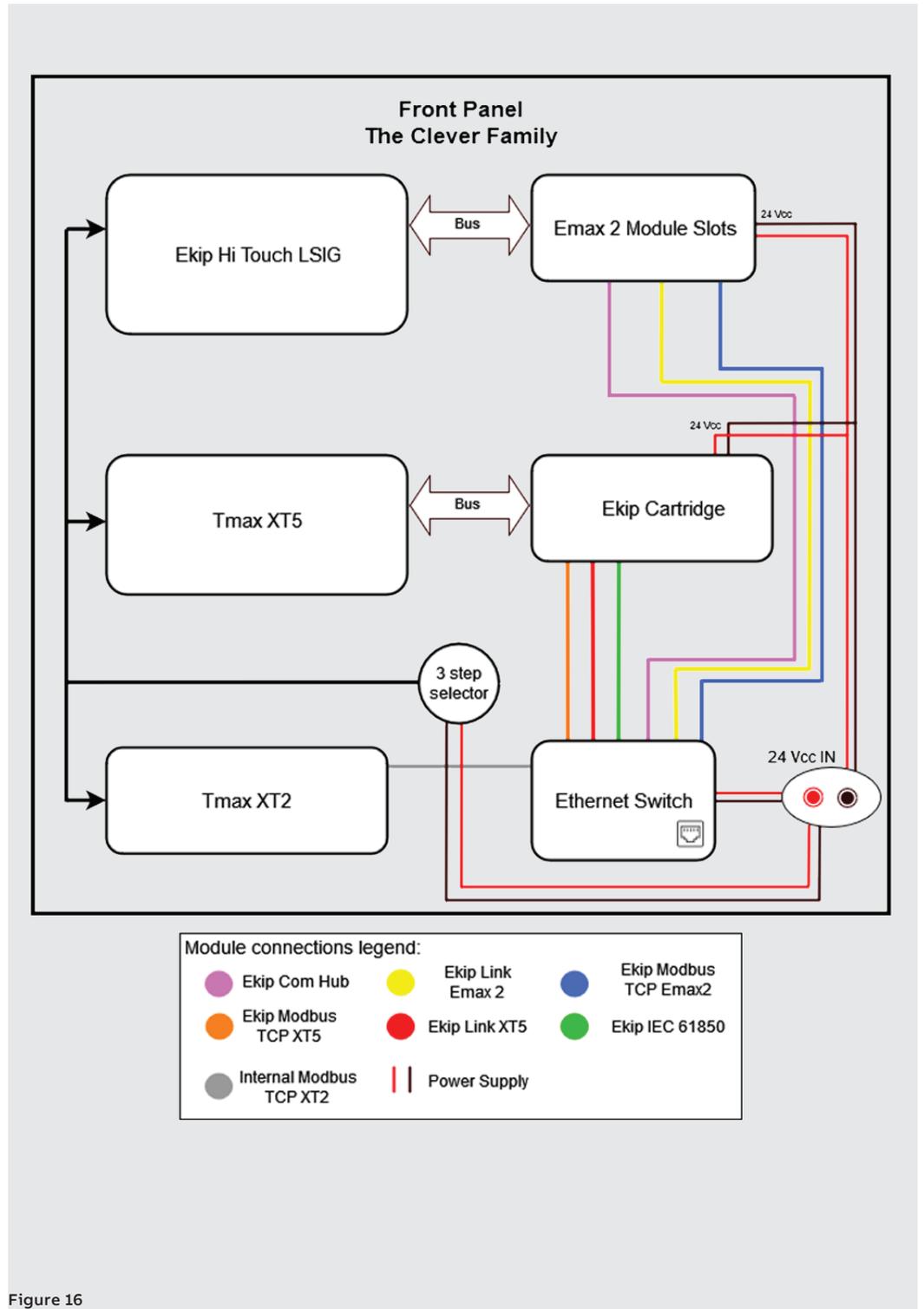
Figure 16

Use

1 - Preliminary operations

The Clever Family Demo-Unit can be remove from its carry case and placed on a work table for use.

Proceed as described below to remove the unit from its carry case.

1. Remove the protection from the top part.
2. Take a firm grip on the handles.

Figure 17

3. Lift the unit towards you and place it vertically on the work table. Continue to hold the unit securely until you have completed the next stage.
4. Turn and fully open both of the rear supporting metal frames.

Figure 18

5. Make sure that the unit is in a steady position before you begin to use it..

Figure 19

The unit can also be kept inside its carry case and powered by the red/black connectors on the front part.

(!) IMPORTANT: keep the unit resting horizontally on the back.

Figure 20

⚠ WARNING! do not set the unit (in its carry case) in the vertical position.

2 - Start Up

As mentioned previously, the system will be consigned together an ABB Test and Programming Key and its power cord. This latter is used to power the entire system by connecting, **alternatively**, one of the two points in the figure.

⚠️ **WARNING! The two power connections are alternative. The system can be energized by using one of the two power sockets on the front OR rear, as shown in the illustrations below.**

⚠️ **WARNING! Make sure that you match the cable with its respective colored connector.**
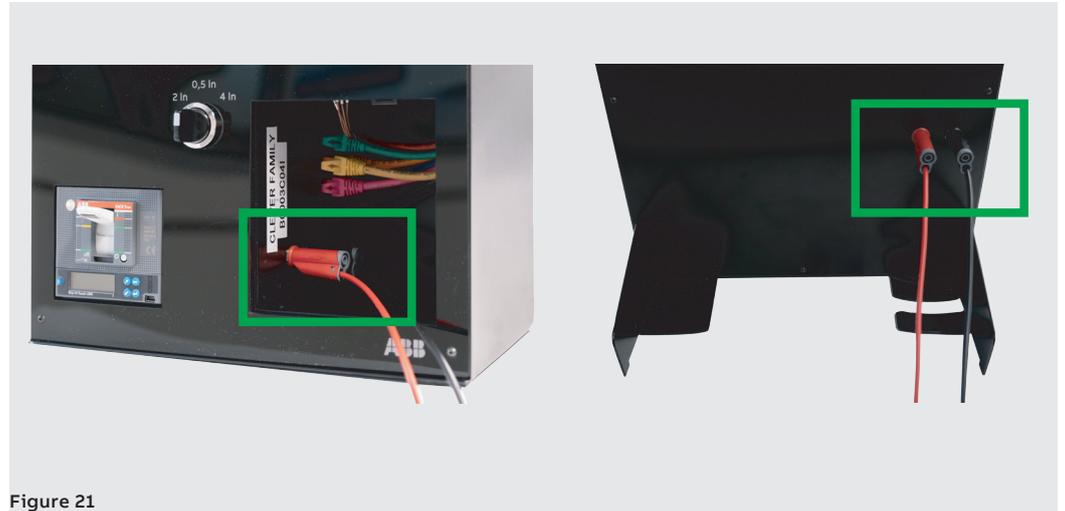
Figure 21

Once the system has been switched on, the tests and simulations can begin.

Dedicated firmware created for demos and tests has been installed in the circuit-breakers. The firmware simulates the presence of current and voltage thus, from the vantage point of the circuit-breaker, it appears to be connected to a real electrical installation.

3 - Connections

Ekip T&P – Ekip Connect 3

Ekip T&P
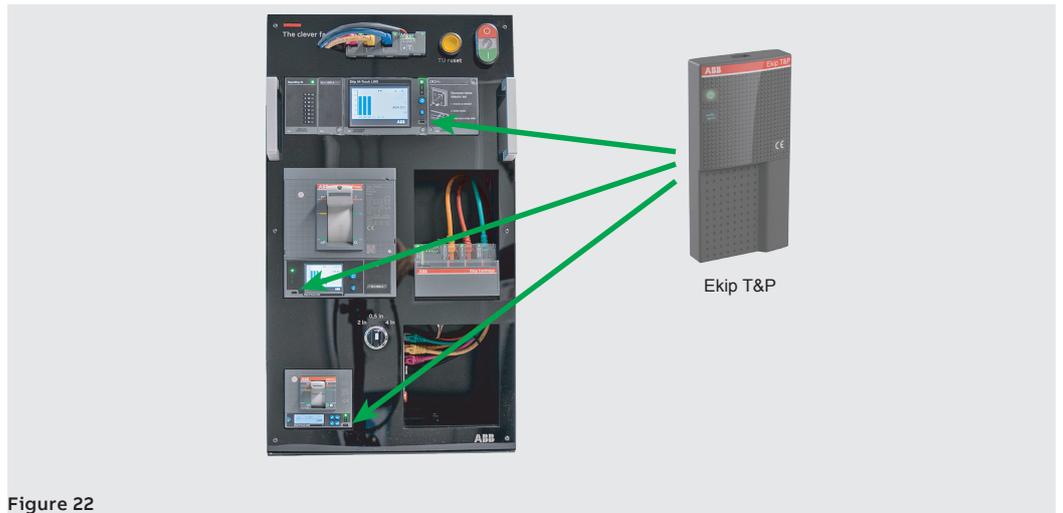
Figure 22

Ethernet – Ekip Connect 3

Ethernet
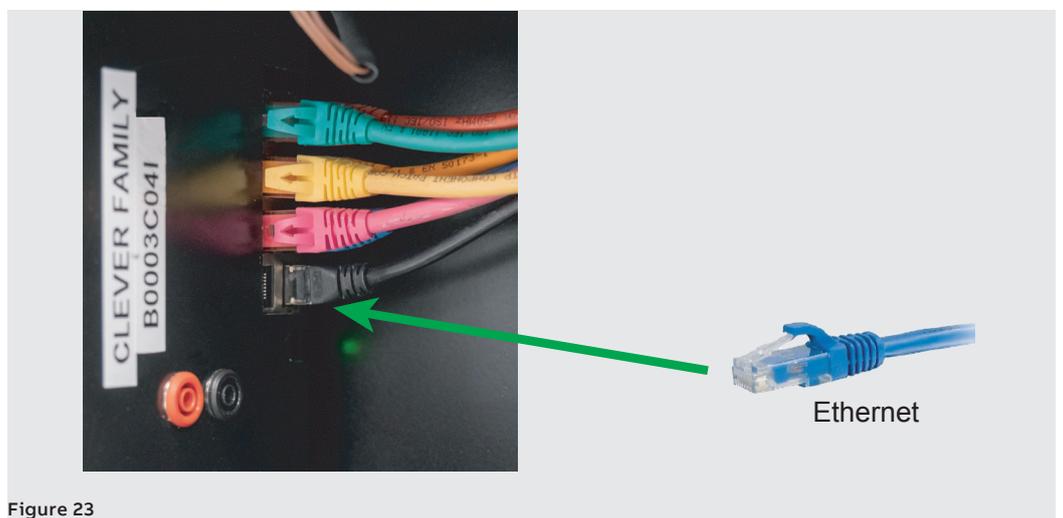
Figure 23

Bluetooth - EPiC
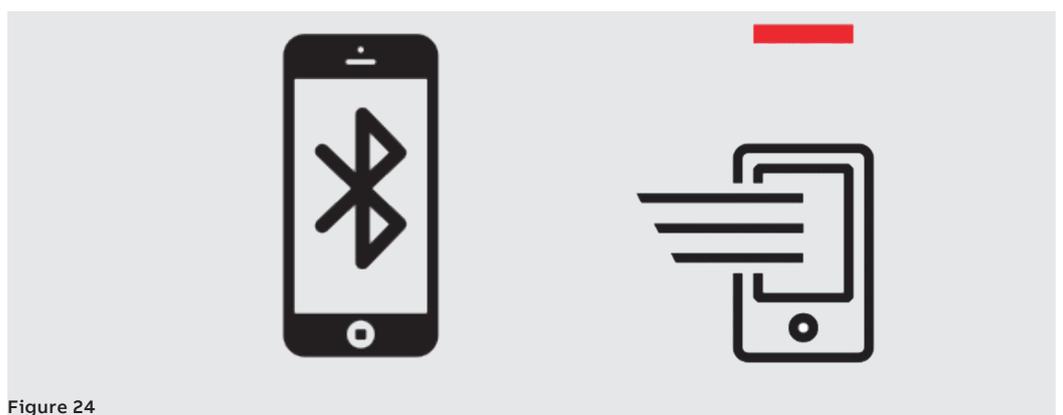
Figure 24

4 - Protections

The simulated current sensed by the circuit-breaker can be piloted using the mechanical selector shown in the figure.

The rated current values for the circuit-breakers are: 1250 A for Emax2, 630A for XT5 and 62 A for XT2. Functioning as a selector, the values that can be set are 0.5 In, 2In and 4 In.
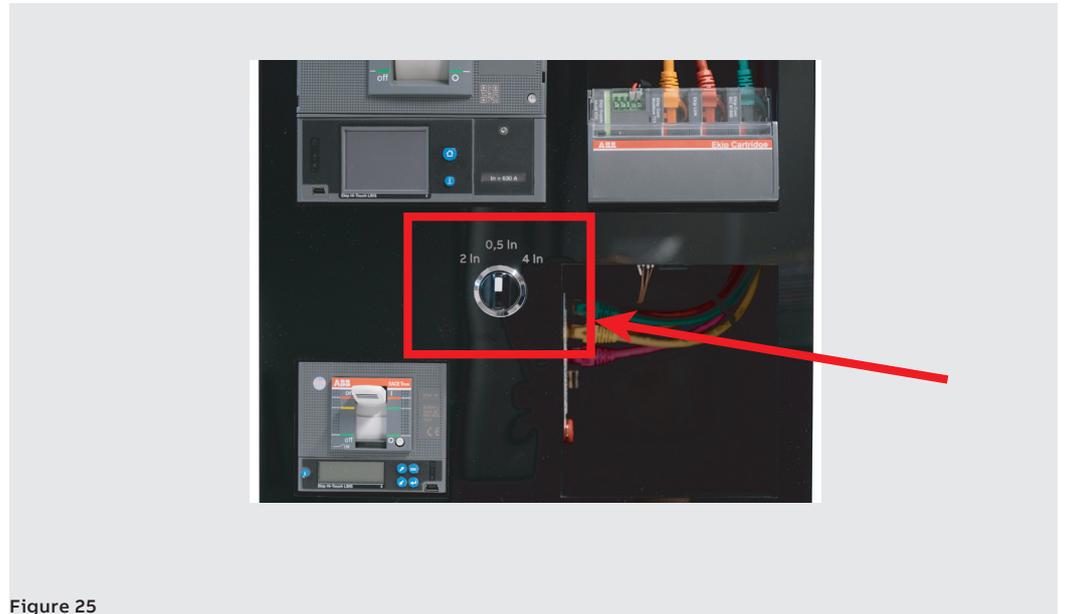
Figure 25

Overload (L) The sequence of operations required to test the overload protection (L) is described below.
- Energize the system
- Position the selector from 0.5 In to 2 In
- The current that passes through the circuit-breaker will be quadrupled.
- warning lw2 will be activated
- The three CBs will trip L protection after about 10 seconds.

If the test is functioning correctly, all the circuit-breakers must have tripped and the HMI must display "L protection".

Short-circuit (S) The sequence of operations required to test the short-circuit protection (S) is described below.
- Energize the system
- Position the selector from 0.5 In to 4 In
- The current that passes through the circuit-breaker will be increased 8-fold.
- The three CBs will trip together, S protection..

If the test is functioning correctly, all the circuit-breakers must have tripped and the HMI must display "S protection".

5 - Monitoring and commissioning

ABB SACE offers applications enabling the entire potential of the Ekip trip units to be used, with regard to power management, electrical data acquisition and analysis, protection testing and maintenance and diagnostics functions. ABB latest generation circuit-breakers offer a vast range of smart features designed to support the parameters of the electrical installation both locally and remotely.

Ekip Connect 3

Ekip Connect is a programming and distribution software that allows users to make full use of the potential of the circuit-breakers, thereby enhancing the efficiency of the electrical installation.

The new generations of circuit-breakers can be connected to the computer via Ekip Connect in a number of ways.

1. Connect the circuit-breaker to the computer via T&P, Ethernet cable or MOXA-RTU serial cable.
2. Open EC3
3. Press the "Scan" button on the left-hand side of the EC3 board corresponding to the chosen physical connection.

If connection has been successful, the name of the device will appear on the left-hand side. You will now be able to consult all the measurements and parameters of the device.
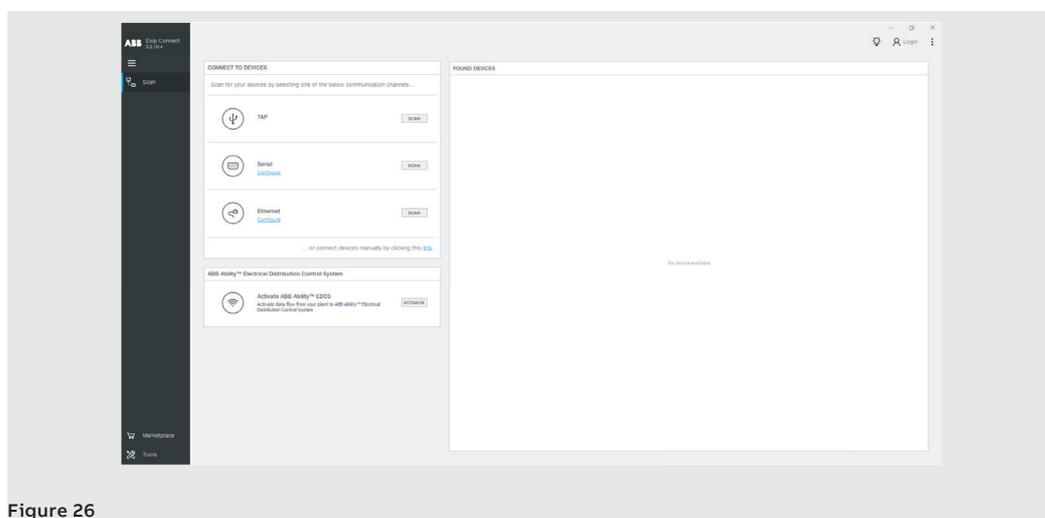
Figure 26

Ekip Connect is available as a free download at: HTTPS://LIBRARY.ABB.COM.

EPiC Mobile

EPiC is a new free mobile app that provides technicians with innovative monitoring and management functions for the circuit-breakers.

If you want to improve the way you work, EPiC is the digital partner you are looking for: ease of installation, smart configuration, assistance and commissioning in a single application.

- **Product Configuration:** connect to ABB AbilityTM Marketplace and download the software package ready to be installed in the product.
- **Product Installation:** accessorize and gain insights from the alerts through Augmented Reality. Read the QR code to obtain product information in real time.
- **Product Commissioning:** Configuration of settings and reporting from the products via BLE and NFC. Read diagnostic data on your smartphone or tablet.
- **Product Assistance:** AR technology supports the remote after-sales assistance functions. Consult the contact list of ABB experts worldwide.
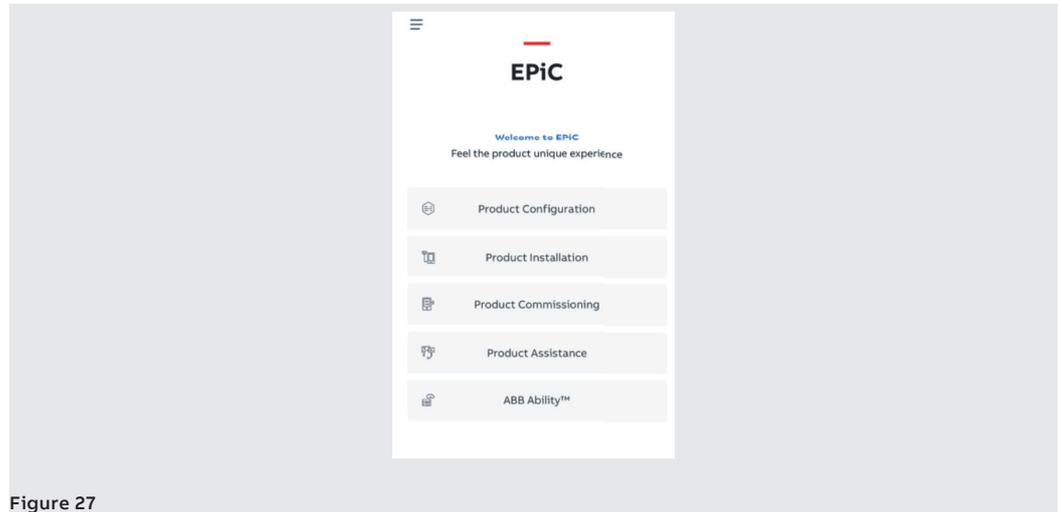
Figure 27

Information about how to use **EPiC** is given below.

- Connect T&P → Run EC3 → enable Bluetooth Low Energy module
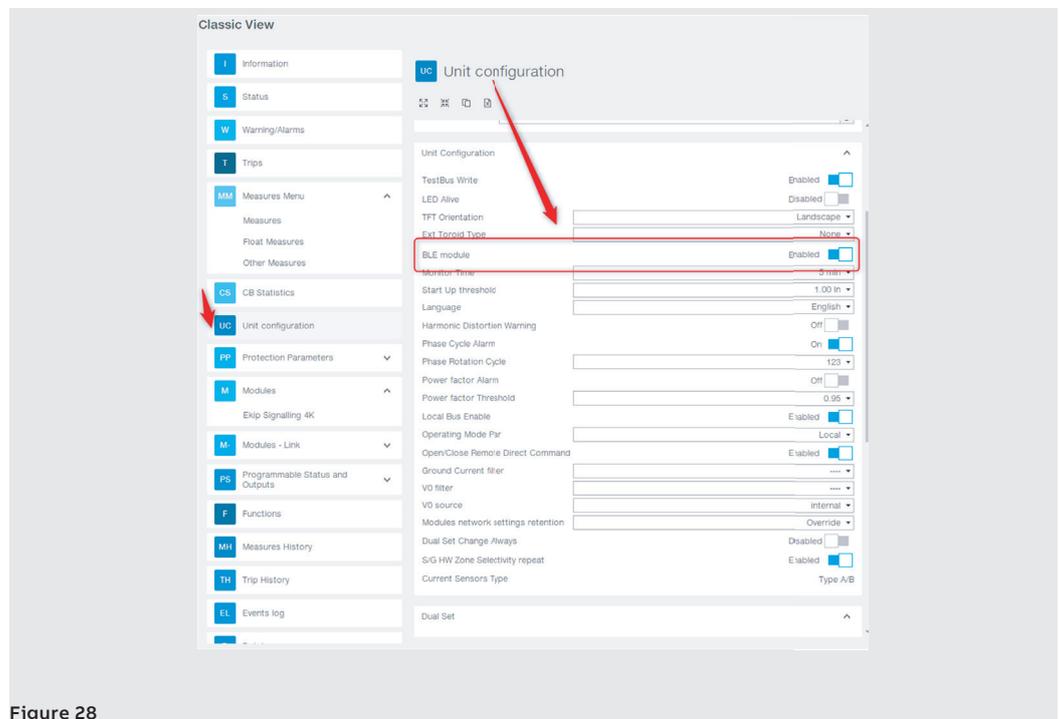
Figure 28

Continued on the next page

Continued on the next page

Continued on the next page

- Press "start pairing" on the HMI of the device
- Make sure that the command is executed

Figure 29

- Run EPiC mobile → Press "product commissioning"
- Select the Bluetooth section
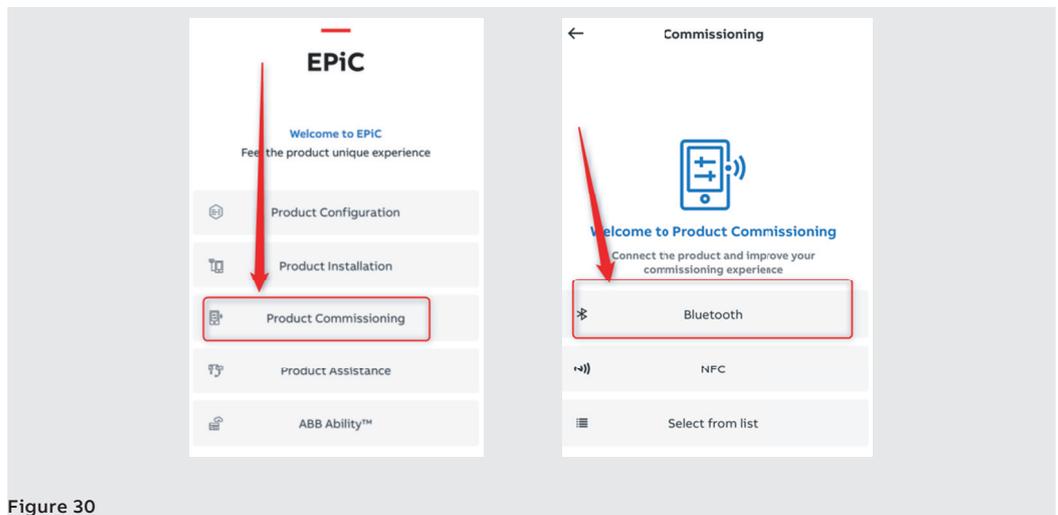
Figure 30

- Enter the Passkey that appears on the screen of the device in your phone.
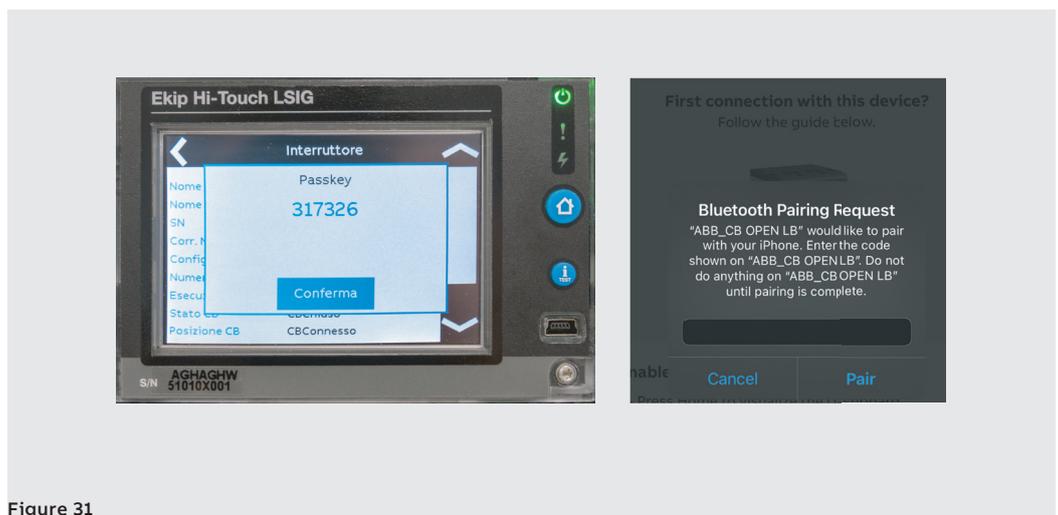
Figure 31

- Press "Manage device" or wait 5 seconds
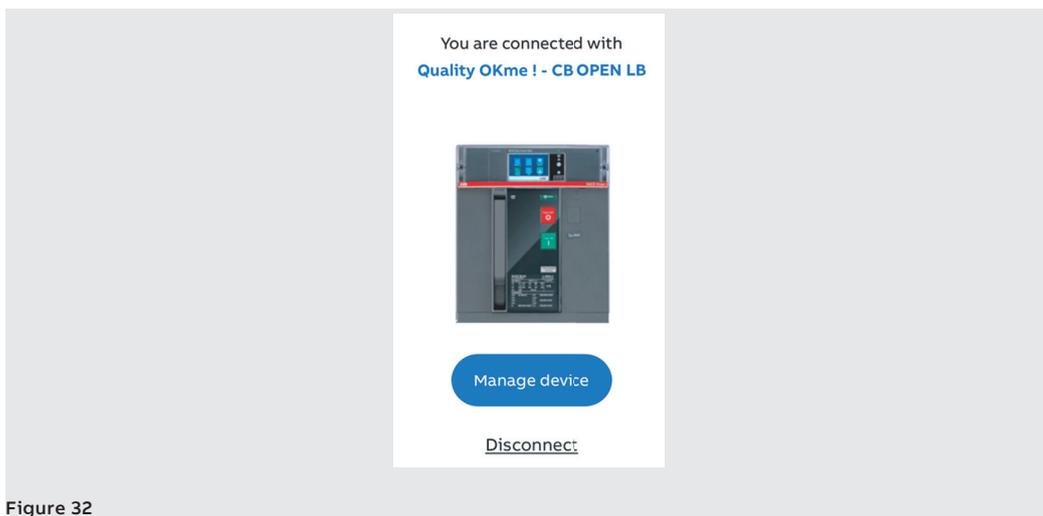
Figure 32

| ABB Ability – Energy and management | ABB Ability™ Energy and Asset Manager (EAM) is the pioneering cloud solution for monitoring, supervising and analyzing the apparatuses and electrical distribution system of the site, focused on consequent improvement of the overall performance, efficiency and safety. |
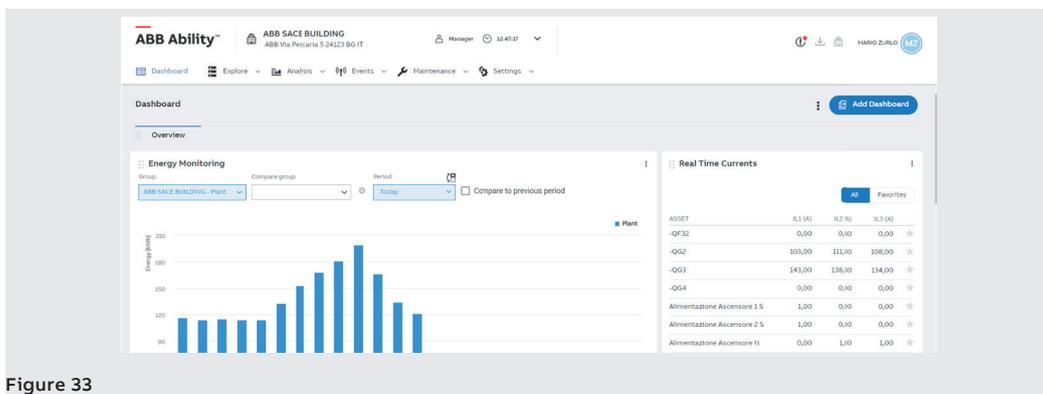
Figure 33

Thanks to its scalable and flexible approach, ABB Ability™ Energy and Asset Manager ensures full integration of the main LV and MV electrical apparatuses installed in the distribution and sub-distribution dashboards. It also allows updates to be made at any time via ABB Ability Marketplace ™ by just a click. A single user-friendly interface allows ABB Ability™ Energy and Asset Manager to assist the user through a cloud computing or hybrid platform, enabling acquired data to be analyzed and the installation to be optimized any time and anywhere.

Commissioning procedure

The commissioning procedure is the process whereby the digital entity of an electrical installation or device is created, published online and made available on the ABB EAM platform. This digital entity acts as an online container for all the acquired data concerning the device. Thus the current and historical data can be remotely accessed and monitored.

- Connect the PC and Ethernet switch to the network in which the device must be visible
- Connect the device to the PC via T&P
- Run Ekip Connect 3
- Scan device with the T&P
- Start provisioning the device in the GLOBAL/TEST environment
- Hub provisioning – Ekip COM Hub
- Check all fields, then press "Go to discovery"
- "Manual Discovery" of Ekip COM Hub
- Press Finish.

The device will now be published and its characteristics and measurements can be viewed in the widgets available in the EAM.

6 - Supporting digital applications

Augmented reality

Goals:

- Speed up circuit-breaker accessory identification
- Increase efficiency when accessories are installed
- A simple user interface
- A digital solution via virtual reality
- Improved product understanding
- Data accessible anywhere
- Innovation as a unique experience.

ℹ️ **NOTE:** *This characteristic, in this Demo-Unit, is only present for TMax XT5.*

Information about how to use this function is given below.

1. Run EPiC Mobile and select "Product Installation"
2. Connection to the Internet is required for the first test. Click on the button. The application will begin to download the assets.
3. Press on the "Augmented reality" section
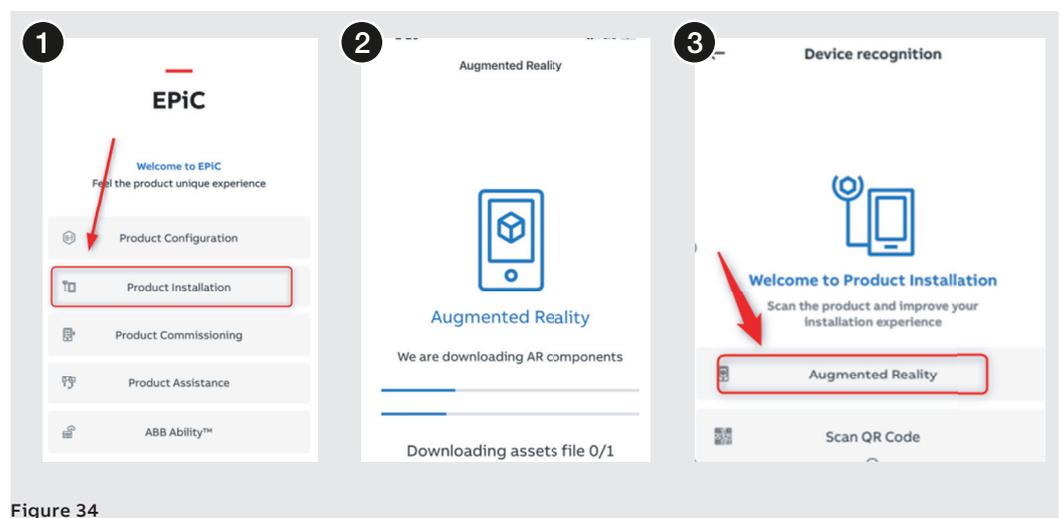
Figure 34

4. Press "scan your device"
5. Wait for the device to be scanned and recognized on the display
6. Press on the central icon. The image will stop moving.
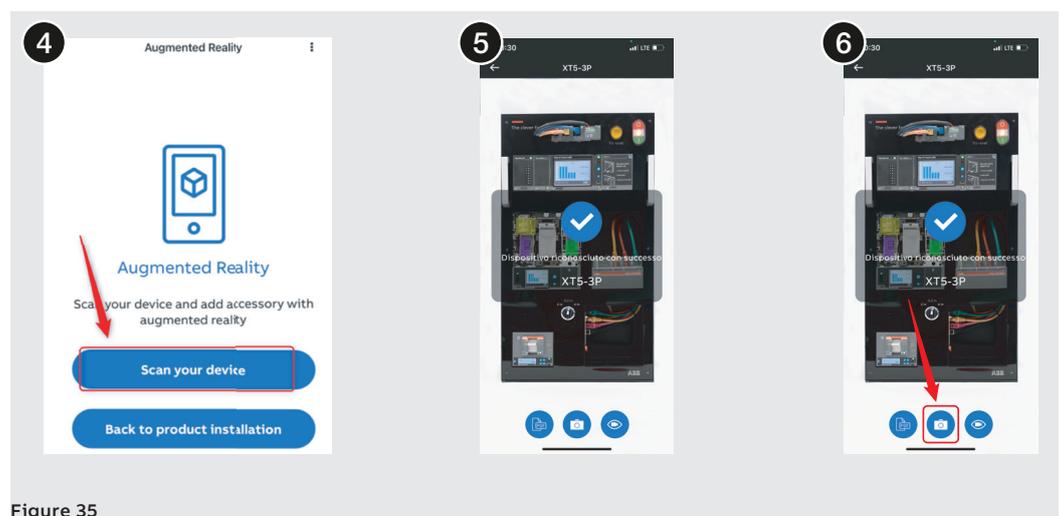
Figure 35

7. Press on the different sections …

Figure 36

8. … you will now be able to choose an accessory from the list

Figure 37

9. Press on the highlighted links for further details about the circuit-breaker
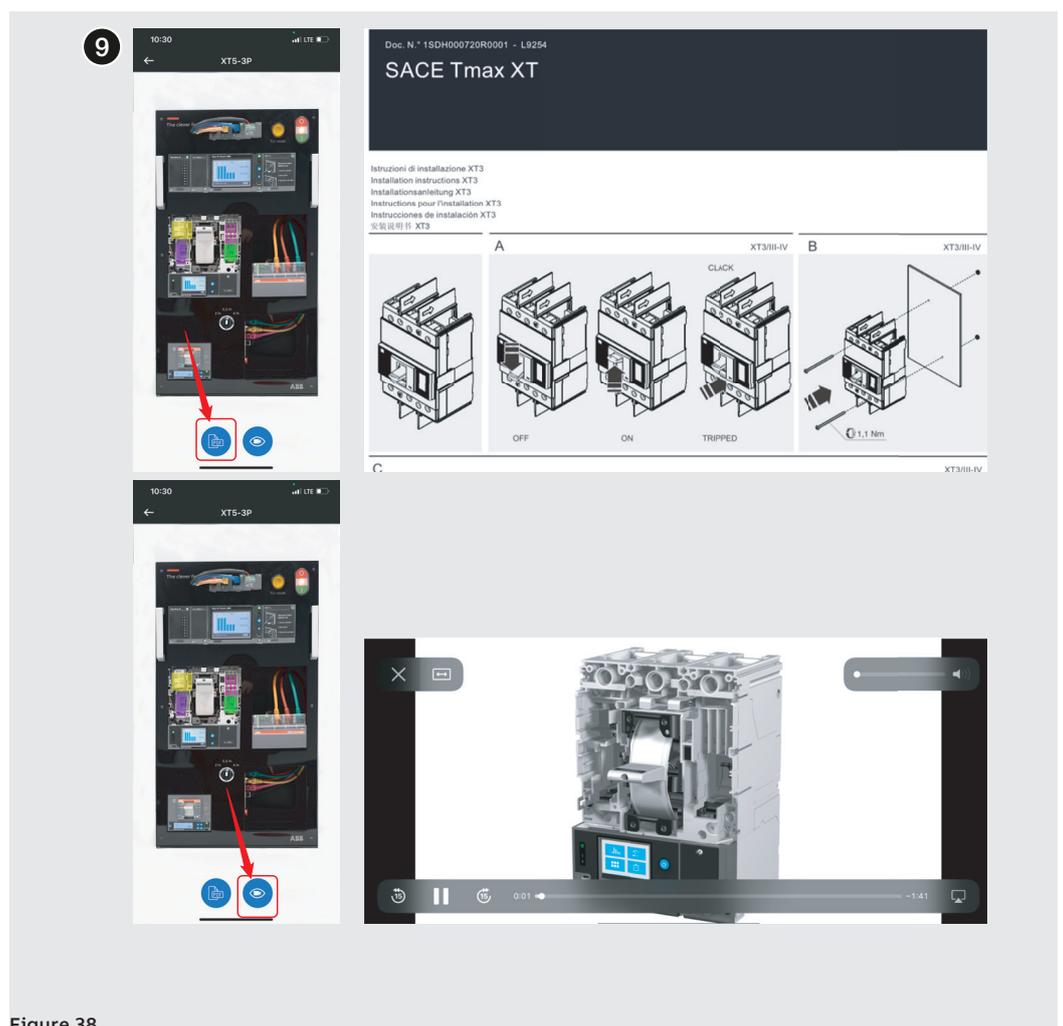
Figure 38

QR Code The new QR code function developed for EPiC allows the user to scan the QR code and obtain further useful information about the scanned circuit-breaker.
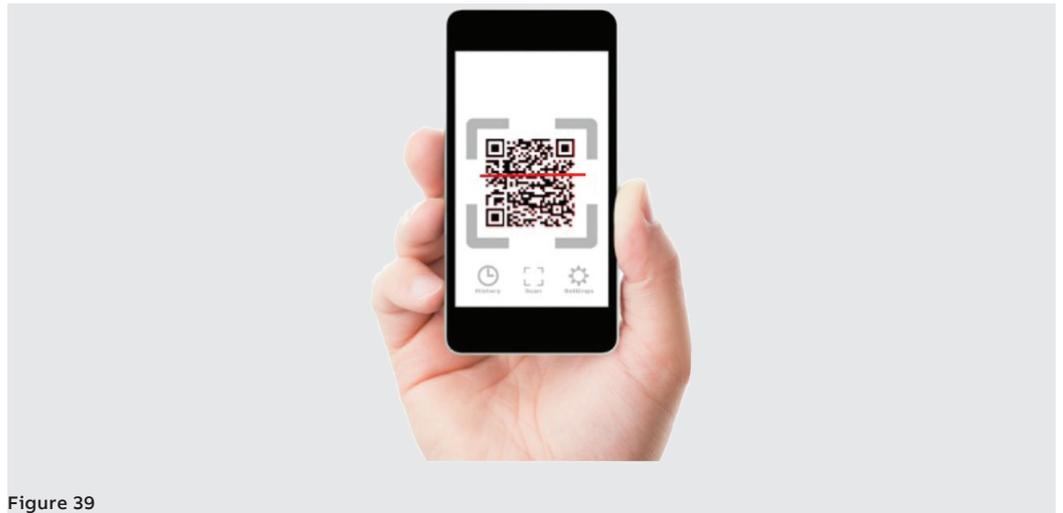
Figure 39

Information about how to use this function is given below:

1. Run the EPiC application using an iOS or Android device
2. Access the "Product Installation" section
3. Scan the QR code
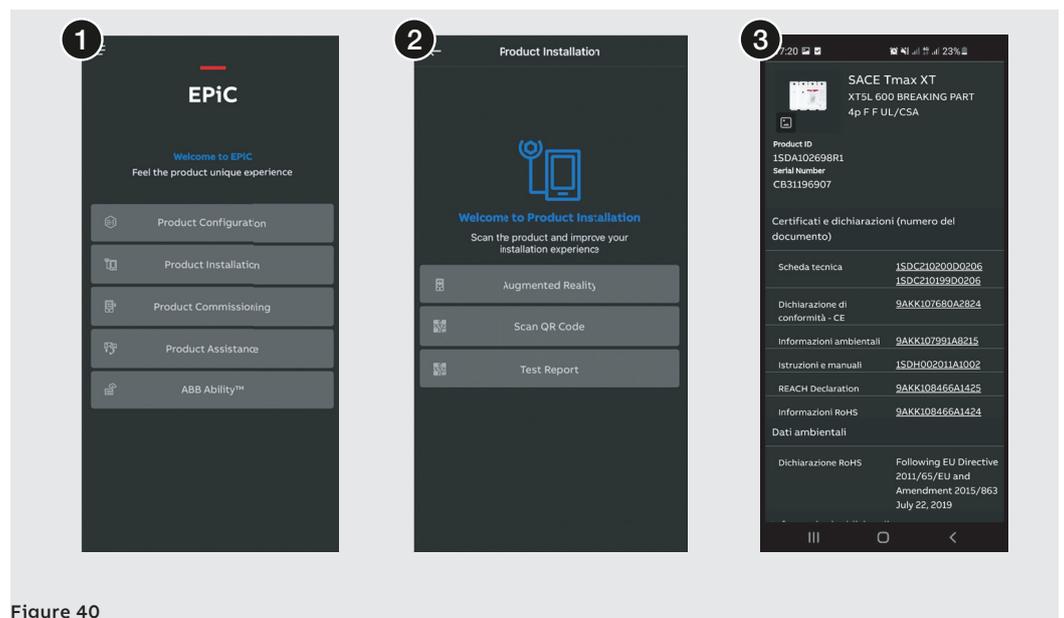
Figure 40

The QR code will direct the user to a Web page where all the information about the scanned device is stored. The user can easily retrieve information such as:

- Product identification number
- Serial number
- Instruction sheet
- Catalogue
- Certifications
- Technical data sheet
- ...

Resetting to factory settings

1 - Reset operations

If the system develops faults, the user must retrieve the flash drive supplied with the Demo-Unit. It contains the YouNIC Step software required to reset to the factory settings. It is very simple to use. The PC must be connected via T&P to the circuit-breaker that needs to be re-configured.

To reset to the factory data the user must:

1. Insert the flash drive into the PC
2. Connect the PC via T&P to the device that needs resetting
3. Install YouNIC Step by clicking on the icon in the flash drive
4. Open the file of the device that needs resetting
   - Trip Unit Emax 2
   - Tmax XT5
   - Tmax XT2
5. Click on "Start".

Pen Drive **Computer** **Ekip T&P** **The Clever Family**

Figure 41
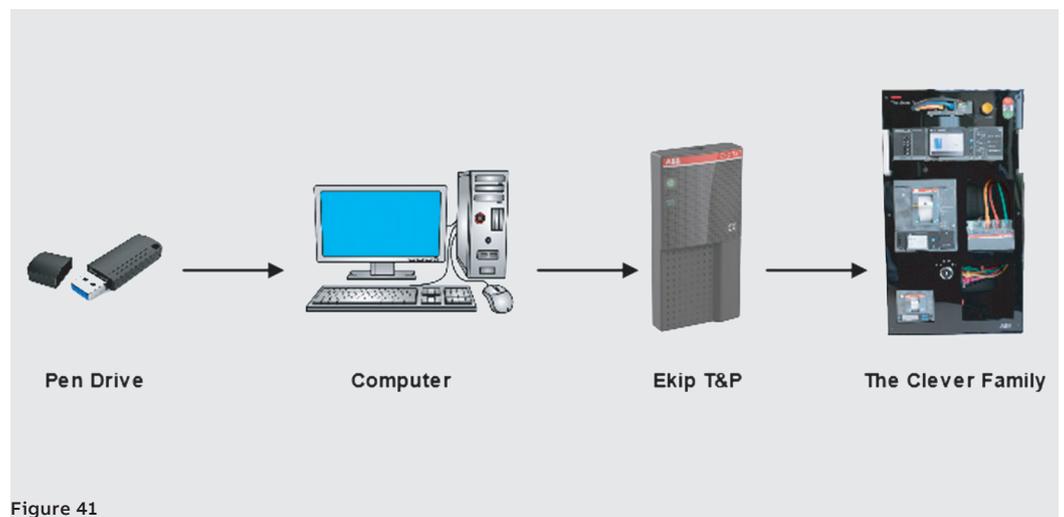
Additional information

1 - Manuals

Reference link

Emax2 Trip Unit – Ekip Hi-Touch LSIG **1SDH001316R0002**.

Tmax XT5 **1SDH002039A1002**.

Tmax XT2 **1SDH002031A1002**.

SACE Tmax XT Catalog **1SDC210100D0206**.

ABB

1SDH002190A1002 - ECN000235589